AMENDMENTS TO THE CLAIMS

This claim listing will replace all prior versions and listings of claims in the application.

Claim Listing:

1. (Currently Amended) A method of genotyping a nucleic acid sample at one or more loci, comprising the steps of:

(a) ~~obtaining a nucleic acid sample to be tested;~~

~~(b)~~ combining ~~the~~ a nucleic acid sample comprising a nucleic acid molecule with one or more locus-specific tagged oligonucleotides under conditions suitable for hybridization of the nucleic acid molecule in the nucleic acid sample to one or more locus-specific tagged oligonucleotides, wherein each locus-specific tagged oligonucleotide comprises (a) a nucleotide sequence capable of hybridizing to a complementary sequence in an oligonucleotide tag and (b) a nucleotide sequence complementary to the nucleic acid molecule in the nucleic acid sample which terminates one nucleotide ~~sequence~~ 5' of a nucleotide locus to be queried in the nucleic acid molecule in the nucleic acid sample, thereby creating an amplification product-locus-specific tagged oligonucleotide complex;

(b e) subjecting the complex to a single base extension reaction in the presence of two or more labeled ddNTPs, wherein the reaction results in the addition of a labeled ddNTP to the locus-specific tagged oligonucleotide, and wherein each type of ddNTP has a label that can be distinguished from the label of the other three types of ddNTPs;

(c ~~d~~) contacting the complex with an oligonucleotide array comprising one or more oligonucleotide tags fixed to a solid substrate under suitable hybridization conditions, wherein each oligonucleotide tag comprises a unique arbitrary sequence complementary and of sufficient length to hybridize to a complementarysequence in a locus-specific tagged oligonucleotide, whereby the complex hybridizes to a specific oligonucleotide tag on the array; and assaying the array to determine the labeled ddNTPs present in the complex hybridized to one or more oligonucleotide tags,

thereby determining the genotype of the queried nucleotide locus ~~in the sample~~.

2. (Currently Amended) A method to aid in determining a ratio of alleles at a polymorphic locus in a sample, comprising the steps of:

(a) using a pair of primers to amplify a region of a nucleic acid in a sample, wherein the region comprises a polymorphic locus, whereby an amplified DNA product is formed;

(b) labeling an extension primer by a single base extension reaction to form a labeled extension primer, wherein the amplified DNA product is used as a template, wherein the extension primer comprises a 3' portion and a 5' portion, wherein the 3' portion is complementary to the amplified DNA product and terminates one nucleotide 5' to the polymorphic locus, wherein the 5' portion is not complementary to the amplified DNA product, whereby a labeled dideoxynucleotide which is complementary to the polymorphic locus is coupled to the 3' end of the extension primer by the single base extension reaction, wherein the single base extension reaction is carried out in the presence of two or more labeled dideoxynucleotides, and wherein each type of dideoxynucleotide ~~present in the reaction~~ bears a distinct label; and

(c) hybridizing the 5' portion of the extension primer to one or more probes complementary to the 5' portion of the extension primer which are immobilized to known locations on a solid support,

thereby determining the ratio of alleles at a polymorphic locus in a sample.

3. (Original) The method of claim 2 wherein two complementary strands of the amplified DNA product are present in the single base extension reaction.

4. (Original) The method of claim 2 wherein two complementary strands of the amplifed DNA product are used as templates in the step of labeling.

5. (Original) The method of claim 2 wherein the label is a fluorescent label.

6. (Original) The method of claim 2 wherein the label is a radiolabel.

7. (Original) The method of claim 2 wherein the label is an enzyme label.

8. (Original) The method of claim 2 wherein the label is an antigenic label.

9. (Original) The method of claim 2 wherein the label is an affinity binding partner.

10. (Original) The method of claim 2 further comprising the step of:
(d) optically detecting a fluorescent label on the solid support.

11. (Cancelled) The method of claim 2 wherein the step of labeling employs at least two distinct dideoxynucleotides bearing distinct labels.

12. (Original) The method of claim 2 wherein the step of labeling employs four distinct dideoxynucleotides bearing distinct labels.

13. (Original) The method of claim 2 further comprising the steps of:
(d) comparing quantities of a first and a second label at a location on the solid support; and
(e) determining the ratio of nucleotides present at the polymorphic locus in the sample.

14. (Original) The method of claim 13 wherein the ratio of nucleotides present at two or more polymorphic loci is determined simultaneously.

15. (Original) The method of claim 2 wherein the sample comprises DNA from two or more individuals.

16. (Original) The method of claim 15 wherein the ratio of nucleotides present at two or more polymorphic loci is determined simultaneously.

17. (Original) The method of claim 2 wherein the solid support is selected from the group consisting of beads, microtiter plates, and oligonucleotide arrays.

18. (Currently Amended) A method to aid in determining a ratio of alleles at a polymorphic locus ~~in a sample~~, comprising the steps of:

(a) labeling an extension primer by a single base extension reaction to form a labeled extension primer, using a DNA molecule containing a polymorphic locus as a template, wherein the extension primer comprises a 3' portion and a 5' portion, wherein the 3' portion is complementary to the DNA molecule and terminates one nucleotide 5' to a polymorphic locus, wherein the 5' portion is not complementary to the DNA molecule, whereby a labeled dideoxynucleotide which is complementary to the polymorphic locus is coupled to the 3' end of the extension primer, wherein the reaction is carried out in the presence of one or more dideoxynucleotides and wherein each type of dideoxynucleotide ~~present in the reaction~~ bears a distinct label; and

(b) hybridizing the 5' portion of the extension primer to one or more probes complementary to the 5' portion of the extension primer which are immobilized to known locations on a solid support,

thereby aiding in the determination of a ratio of alleles at a polymorphic locus.

19. (Original) The method of claim 18 wherein two complementary strands of the DNA molecule are present in the single base extension reaction.

20. (Original) The method of claim 19 wherein each complementary strand of the DNA molecule is used as a template to label an extension primer.

21. (Original) The method of claim 18 wherein the label is a fluorescent label.

22. (Original) The method of claim 18 wherein the label is a radiolabel.

23. (Original) The method of claim 18 wherein the label is an enzyme label.

24. (Original) The method of claim 18 wherein the label is an antigenic label.

25. (Original) The method of claim 18 wherein the label is an affinity binding partner.

26. (Original) The method of claim 18 further comprising the step of:
(c) optically detecting a fluorescent label on the solid support.

27. (Original) The method of claim 18 further comprising the steps of:
(c) comparing quantities of a first and a second label at a location on the solid support; and
(d) determining the ratio of nucleotides present at the polymorphic locus in the sample.

28. (Original) The method of claim 27 wherein the ratio of nucleotides present at two or more polymorphic loci is determined simultaneously.

29. (Original) The method of claim 18 wherein the sample comprises DNA from two or more individuals.

30. (Original) The method of claim 26 wherein the ratio of nucleotides present at two or more polymorphic loci is determined simultaneously.

31. (Original) The method of claim 18 wherein the step of labeling employs at least two distinct dideoxynucleotides bearing distinct labels.

32. (Original) The method of claim 18 wherein the step of labeling employs four distinct dideoxynucleotides bearing distinct labels.

33. (New) The method of any one of claim 1, wherein the oligonucleotide array comprises at least 10 oligonucleotide tags fixed to a solid substrate.

34. (New) The method of any one of claim 1, wherein the oligonucleotide array comprises at least 100 oligonucleotide tags fixed to a solid substrate.

35. (New) The method of any one of claim 1, wherein the oligonucleotide array comprises at least 1000 oligonucleotide tags fixed to a solid substrate.

36. (New) The method of any one of claim 2, wherein the oligonucleotide array comprises at least 10 oligonucleotide tags fixed to a solid substrate.

37. (New) The method of any one of claim 2, wherein the oligonucleotide array comprises at least 100 oligonucleotide tags fixed to a solid substrate.

38. (New) The method of any one of claim 2, wherein the oligonucleotide array comprises at least 1000 oligonucleotide tags fixed to a solid substrate.

39. (New) The method of any one of claim 18, wherein the oligonucleotide array comprises at least 10 oligonucleotide tags fixed to a solid substrate.

40. (New) The method of any one of claim 18, wherein the oligonucleotide array comprises at least 100 oligonucleotide tags fixed to a solid substrate.

41. (New) The method of any one of claim 18, wherein the oligonucleotide array comprises at least 1000 oligonucleotide tags fixed to a solid substrate.